Revision : 2 12/30/91 K.4

PHASE II WORK PLAN - PART A
REMEDIAL INVESTIGATION/ FEASIBILITY STUDY
LENZ OIL SERVICES, INC.
LEMONT, ILLINOIS

160913

PHASE II WORK PLAN - PART A
REMEDIAL INVESTIGATION/
FEASIBILITY STUDY

LENZ OIL SERVICES, INC.
LEMONT, ILLINOIS

REVISION: 2

SUBMITTED BY:

LENZ OIL SETTLING RESPONDENTS

DECEMBER 30, 1991

PREPARED BY:

ENVIRONMENTAL RESOURCES MANAGEMENT- NORTH CENTRAL, INC.
102 WILMOT ROAD, SUITE 300
DEERFIELD, IL 60015

PROJECT NUMBER: 0252

TABLE OF CONTENTS

1.0 INTRODUCTION

This document presents an analysis of the sufficiency of the data collected during the ground water portion of the Phase I Lenz Oil Service, Inc. Remedial Investigation/Feasibility Study (RI/FS) and proposes Phase II investigative activities necessary to complete the ground water portion of the RI/FS. A companion document (Phase II Work Plan - Part B) has been prepared by EBASCO Services, Inc., on behalf of the Illinois Environmental Protection Agency (IEPA), that presents an analysis of the sufficiency of the data collected during the soil, sediment, and surface water portions of the Phase I RI/FS and the Phase II activities necessary to complete those investigations.

According to the Lenz Oil Service, Inc. RI/FS Work Plan, the objective of the RI is to characterize the type, extent, and migration of contamination attributable to past operations at the Lenz Oil site, and the objective of the FS is to develop and evaluate remedial alternatives based upon the results of the RI. In order to fully characterize the Lenz Oil Service, Inc. site, as defined by the RI/FS Work Plan, ERM-North Central, Inc. (ERM-North Central) established the following objectives for the ground water investigation:

- Geology - Determine the stratigraphy and geotechnical characteristics of the subsurface materials at the site.

- Ground Water Hydrology - Determine the hydrogeological characteristics of the site, including the interaction between surface water and ground water.

- Ground Water Contamination - Delineate the type and extent of ground water contamination and its migration characteristics.

- o Receptors - Identify and assess the potential impact to ground water and surface water receptors near the Lenz Oil Service, Inc. site.

When these objectives have been met, the ground water contamination will be characterized in terms of type, extent, and migration.

The Phase I activities pertaining to the ground water investigation that have been conducted to date include: (1) installation of soil borings and monitoring wells, (2) geologic logging of the soil and bedrock at each boring location, (3) screening of the soil and bedrock for the presence of visible contaminants and elevated organic vapor content, (4) geotechnical testing of selected soils, (5) *in situ* permeability testing of the aquifer materials, (6) monthly water level measurements, (7) collection and analysis of Round One ground water samples, (8) performance of a regional and site-specific fracture analysis, (9) collection of ground water and surface water usage data, and (10) review of published regional geological and hydrogeological information. To the extent necessary, data generated by these activities are presented or referenced, and interpreted in this Phase II Work Plan. The sufficiency of the Phase I data is evaluated, data gaps are identified, the Phase II RI objectives are described, and Phase II RI tasks are proposed that satisfy the Phase II RI objectives.

2.0 PHASE I DATA SUFFICIENCY EVALUATION

The sufficiency of the Phase I database is evaluated in this section by describing the extent to which each of the ground water investigation objectives has been met. This is accomplished by presenting each objective and the data pertinent to achieving that objective. The data set is briefly interpreted and then evaluated in terms of completeness, comparability, and representativeness. If ERM-North Central has determined that the objective has not been fulfilled with the existing data set, the data gaps are identified.

2.1 Geology

The first objective of the ground water investigation is to determine the stratigraphy and geotechnical characteristics of the subsurface materials at the site. Published reports regarding the surficial and bedrock geology of DuPage County provided a general stratigraphic framework for shallow deposits encountered at the Lenz Oil Service, Inc. site. Site-specific data were collected from the existing boring logs, a field fracture analysis, and the boring logs from the eight additional stratigraphic borings. Geotechnical samples were collected from representative subsurface materials encountered at the site and tested for particle size, total porosity, and total organic carbon.

As demonstrated in Sections 2.7.1, 2.7.2, and 2.7.3 of Technical Memorandum No. 1 (ERM-North Central, 1991a) and Section 3.1 of Technical Memorandum No. 3A (ERM-North Central, 1991b), the stratigraphy and geotechnical characteristics of the subsurface materials below the Lenz Oil site have been determined to the extent necessary to meet the objectives of the RI/FS. No significant geological data gaps exist, and no additional geological investigations are proposed.

2.2 Ground Water Hydrology

The second objective of the ground water investigation is to determine the hydrogeologic properties of the water-bearing strata at the site, including the vertical and horizontal flow characteristics. In accordance with the approved Work Plan, the hydrogeology of the site was investigated by: (1) installing monitoring wells; (2) collecting monthly water level measurements; (3) performing *in situ* aquifer characterization; (4) studying fracture trends in the bedrock; and (5) conducting laboratory tests of total porosity, total organic carbon, and particle size.

As demonstrated in Section 2.8 of Technical Memorandum No. 1 (ERM-North Central, 1991a) and Sections 3.2 and 3.3 of Technical Memorandum No. 3A (ERM-North Central, 1991b), the regional and site-specific hydrogeological characteristics of the surficial aquifer below the site have been extensively investigated and are well-defined. With one exception, the current data set is sufficient to meet the hydrogeological objectives of the RI/FS. Ground water flow near monitoring well cluster G104 is not clearly understood. An anomalously high static water level is consistently measured in monitoring well G104L, and may be indicative of a poorly constructed monitoring well or a yet to be discerned ground water flow influence. The boring log for the G104 well cluster is not sufficiently detailed to explain the anomalous static water levels from the well. Additional stratigraphic data from the G104 location is needed to evaluate the cause of the anomalously high static water level in G104L. Depending on the cause of the anamolous water level, the existing well cluster at G104 may have to be replaced, and static water level measurements may have to be collected from the replacement well for several months. With the exception of the foregoing data gap, the Phase I ground water hydrological data are sufficient to address the RI/FS objectives.

2.3 Ground Water Contamination

The third objective of the ground water investigation is to delineate the nature and extent of site-derived ground water contamination. To this end, 23 monitoring wells were sampled and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), and Target Analyte List (TAL) dissolved and total metals and cyanide. An oily nonaqueous phase liquid (NAPL) floating on top of the ground water below part of the site was discovered during the Phase I investigation and was analyzed for some of the foregoing parameters.

As discussed in Section 4.0 of Technical Memorandum No. 3A (ERM-North Central, 1991b), ground water contamination derived from the Lenz Oil site was partially characterized and delineated by the Phase I activities. With a few exceptions, all of the Phase I organic analytical data for the ground water samples are usable and can fully characterize the nature of the organic contamination in the ground water. However, because seasonal variations in ground water flow may affect organic contaminant migration, the extent of organic contamination in the ground water may change with time and, therefore, cannot be fully evaluated with one round of data. Furthermore, with the exception of mercury, the inorganic analytical data for the Phase I ground water samples were rejected due to laboratory technical and procedural deficiencies. Therefore, insufficient data exist to characterize the nature and extent of inorganic ground water contamination, if any.

The vertical and lateral extent of the NAPL was well-defined by the existing monitoring well network and soil boring logs, and the composition of the NAPL was partly determined by the analysis of a sample of the NAPL from monitoring well G106L. However, the physical and chemical nature of the NAPL has not been sufficiently characterized to evaluate appropriate remedial alternatives.

In summary, the existing set of ground water and NAPL data is insufficient to fully characterize the nature and extent of ground water contamination attributable to Lenz Oil site. The following gaps in the Phase I data have been identified:

- Insufficient physical and chemical data to fully evaluate the nature of the NAPL.
- Insufficient inorganic data to characterize the nature and extent of the ground water contamination.
- Insufficient organic data to characterize the seasonal variations in the extent of the ground water contamination.
- Insufficient data to delineate the northeastern extent of the contaminant plume.
- Analytical detection limits that are too high to fully evaluate the potential risk to human health posed by the contaminated ground water.

These data gaps will be addressed during the completion of the proposed Phase II work tasks. If these gaps are adequately filled by the results of the Phase II investigation, the ground water objectives for the RI/FS will be accomplished.

2.4 Ground Water Contamination Receptors

The fourth objective of the ground water investigation is to identify potential receptors of site-derived ground water contamination. Two groups of potential receptors of contaminated ground water were identified in Technical Memorandum No. 1 (ERM-North Central, 1991a): ground water users and Des Plaines River water users.

2.4.1 Ground Water Well Receptors

As discussed in Section 4.7.1 of Technical Memorandum No. 1 (ERM-North Central, 1991a), a ground water usage survey was conducted for the area within a two-mile radius of the Lenz Oil site. This survey included a review of all of the pertinent water well records available from the Illinois Geological Survey and the Illinois State Water Survey as well as water usage records for the local water systems. The purpose of the survey was to determine: (1) the usable aquifers in the area; (2) the number, type, and location of wells in the vicinity of the site; (3) the construction (i.e. depth, screened intervals, and casing) of the wells; (4) the number and locations of wells that pump water from the potentially contaminated surficial aquifer; and (5) the wells that are suitable candidates for sampling during Phase II of the RI.

A total of 310 residential, commercial, and industrial wells were identified as being located within a two-mile radius of the Lenz Oil Service, Inc. site. Over 98% of these wells utilize the surficial Racine Dolomite aquifer, and 22 of these wells are located within one mile of the site. The owners and locations of these wells are presented in Technical Memorandum No. 1 (ERM-North Central, 1991a).

As discussed in Section 5.0 of Technical Memorandum No. 3A (ERM-North Central, 1991b), an organic contaminant plume of limited areal extent is present in the surficial aquifer below and

downgradient of the Lenz Oil site. Because of the limited extent of the plume, only two private water wells could potentially be affected by the contaminated ground water. These two wells are the Corwin Lenz well, situated immediately northeast of the site, and the Williams Bait Shop well, located southeast of the site. Because municipal water was provided to all residents in the vicinity of the Lenz Oil Service, Inc. site in 1988, these wells are no longer the source of potable water for these residences. However, both wells are still in service and are used as sources of nonpotable water. Both wells have been previously sampled and analyzed for the contaminants detected at the Lenz Oil site. Although no demonstrable contamination has ever been detected in the Corwin Lenz well, samples from the Williams well have contained concentrations of VOCs comparable to those detected in the nearby monitoring wells. The private well sample results are consistent with the nature and extent of the organic contaminant plume described in Section 5.0 of Technical Memorandum No. 3A (ERM-North Central, 1991b).

Although the Williams well is located within the contaminant plume and historically has shown evidence of contamination, additional sampling of the well is not necessary to define the nature and extent of ground water contamination. Monitoring well clusters are located upgradient, downgradient, and on both sides of the Williams well, and the ground water contaminant plume is more precisely characterized by using the monitoring well data. The monitoring wells have been constructed for the specific purpose of characterizing ground water contamination, whereas the Williams well is an open borehole that was not installed for monitoring purposes. Furthermore, because the Williams well was constructed as an open borehole, it may provide a conduit for the downward migration of contamination. To avoid further spreading of contamination (via downward migration or the use of the well water for irrigation, etc.), the well should be closed and properly abandoned.

Additional sampling of the Corwin Lenz well may provide useful data for evaluating the extent of the ground water contaminant plume. Because the well is located beyond the existing monitoring well network, sampling results from the well could be used to verify the extent of contaminant migration and the potential impact on a neighboring private well. However, the well is an open borehole, and the associated piping and well construction materials are not monitoring well quality. Therefore, these factors must be considered when interpreting any analytical results from this well. If contamination is detected in the Corwin Lenz well, consideration should be given to closing and properly abandoning the well. These actions would be taken to prevent the downward migration of contaminants in the well's open borehole and the spreading of contamination by using the well water for irrigation.

The current set of ground water user data is sufficient to determine the extent of ground water usage and the potential effects on drinking water wells in the vicinity of the site. No additional ground water receptor data are needed to support the FS, Risk Assessment, or the ATSDR Public Health Assessment. Although no data gaps were identified in the Phase I ground water receptors results, acquiring ground water analytical data for the Corwin Lenz well may satisfy some of the ground water contamination data gaps.

2.4.2 Surface Water Receptors

A surface water usage survey was conducted along the Des Plaines River Valley for the area within two miles downstream of the Lenz Oil site. The results of this survey are presented in Section 4.7.2 of Technical Memorandum No.1 (ERM-North Central, 1991a). Several industries obtain their process water from the Chicago Sanitary and Ship Canal from within this area, but no drinking water intakes were identified along the Des Plaines River, the Chicago Sanitary and Ship Canal, or the Illinois and Michigan Canal.

Section 5.0 of Technical Memorandum No. 3A (ERM-North Central, 1991b) indicates that the organic contaminant plume migrating from the Lenz Oil site has not reached the Des Plaines River. Although the ground water flow data clearly show that the surficial aquifer discharges to the Des Plaines River, the detectable contaminant plume front is approximately 100 feet northwest of the river.

The current set of surface water user data is sufficient to meet the objectives of the RI/FS, and support the FS, Risk Assessment, and the ATSDR Public Health Assessment. No gaps in the Phase I surface water receptor data have been identified.

3.0 PHASE II REMEDIAL INVESTIGATION OBJECTIVES

The overall objective of the Phase II RI is to collect data of sufficient quantity and quality to complete the characterization of the nature and extent of the site-derived contamination to ensure that appropriate remedial alternatives can be identified and evaluated. Specifically, the objectives of the ground water portion of the Phase II RI include:

- Reevaluating the stratigraphy in the vicinity of well cluster G104 to further define ground water flow.

- Collecting sufficient data to characterize the physical and chemical nature of the NAPL.

- Collecting inorganic ground water data of sufficient quantity and quality to characterize the nature and extent of any site-derived inorganic ground water contamination.

- Collecting organic ground water data of sufficient quantity and quality to characterize seasonal variations in the extent of any site-derived organic ground water contamination.

- Collecting ground water analytical data of sufficient quality to evaluate the potential risk to human health posed by drinking ground water from a neighboring residential well.

- Minimizing the spread of ground water contamination by closing and abandoning contaminated private wells.

These Phase II RI objectives are designed to address gaps in the Phase I RI data. The data obtained from the Phase II RI will be used in combination with the Phase I RI data to further characterize contaminant source(s) and pathways of contaminant transport. The results will be incorporated into the Baseline Risk Assessment, presented in the Lenz Oil RI Report and will be used to identify and evaluate remedial alternatives in the FS.

4.0 PHASE II REMEDIAL INVESTIGATION TASKS

The following Phase II RI tasks are proposed to satisfy the Phase II RI objectives, as defined by the sufficiency evaluation of the Phase I data. Five activities are proposed: (1) installation of a soil boring and possibly a shallow monitoring well near monitoring well cluster G104, (2) collection and analysis of one NAPL sample to better characterize its physical and chemical properties, (3) collection and analysis of a second round of ground water samples from the monitoring well network, (4) collection and analysis of a ground water sample from the Corwin Lenz residential well, and (5) abandonment of the private well on the Williams property and possibly the well on the Corwin Lenz property. The field and laboratory procedures to be used during these Phase II activities are briefly in the following subsections. Detailed descriptions of the laboratory procedures to be utilized during the Phase II RI are presented in the Quality Assurance Project Plan (QAPP) Addendum (ERM-North Central, 1991c). The Phase II ground water sampling and analysis program is summarized on Table 4-1.

4.1 Soil Boring/Monitoring Well Installation

One soil boring will be drilled and sampled in the vicinity of monitoring well cluster G104. The boring will be advanced to a minimum depth of 10 feet below the water table, using the procedures described in Section 5.1 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a). If the hydrogeological data obtained from the soil boring are sufficient to explain the anomalously high ground water level measured in monitoring well G104L, the boring will be filled with a neat cement grout using a tremie pipe. If the anomalous water level cannot be explained by the soil boring alone, a shallow monitoring well (to be designated MW-8S), that straddles the water table will be constructed in the boring. The monitoring well will be installed and developed using the same procedures described for the shallow monitoring wells in Section 5.1 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a). The monitoring

well's well screen will be at least as deep as G104D's well screen (12.92 feet below grade). If monitoring well MW-8S is installed, monitoring wells G104L and G104D will be abandoned in accordance with the procedures specified in the Illinois Water Well Construction Code (77 Illinois Administrative Code, Part 920). Approval to abandon the monitoring wells G104L and G104D will be authorized in writing by USEPA and IEPA prior to abandonment.

4.2 Nonaqueous Phase Liquid Sampling

To evaluate the remedial alternatives for the NAPL, its physical and chemical properties must be characterized. Therefore, one sample of the NAPL will be collected from monitoring well G106L and submitted for laboratory analysis. The NAPL sample will be analyzed as a medium-concentration sample for: (1) TCL VOCs, SVOCs, and pesticides/PCBs, (2) TAL total metals and cyanide, (3) Toxicity Characteristics Leaching Procedure (TCLP) organics and inorganics, (4) specific gravity, and (5) viscosity. These analyses will be performed by RMAL Laboratory, located in Arvada, Colorado in accordance with the procedures specified in the QAPP Addendum.

The NAPL sample will be collected as follows:

- The interface probe, bailer, rope, and any other equipment to be inserted in the well will be decontaminated in accordance with the procedures presented in Section 5.2 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a).

- The depth to water and the depth to the NAPL will be measured by using an interface probe.

- A clear, bottom-filling, Teflon bailer will be dedicated to the well and used to withdraw the NAPL sample.

- The sample will then be dispensed from the bailer into the appropriate sample containers in the following order: (1) VOC, (2) SVOC, (3) pesticide/PCB, (4) total metals, (5) cyanide, (6) TCLP, (7) viscosity, and (8) specific gravity. The VOC, metals, and cyanide samples will be preserved with HCL, HNO_3, and NaOH, respectively, as appropriate. All sample containers will be identified as described in Section 4.0 of the QAPP Addendum.

- If sufficient quantity of NAPL is present in the well, a duplicate sample will be collected and analyzed for VOC, SVOC, pesticide/PCB, total metals, cyanide, and TCLP.

- A small portion of the sample will be dispensed into a glass jar and described. An HNu and the headspace technique will be used to obtain a semiquantitative VOC concentration for the sample.

- The laboratory samples will be preserved and shipped to the laboratory under strict chain-of custody procedures as described in Section 6.1 of the approved QAPP (ERM-North Central, 1990b). Because the NAPL is considered a medium-concentration sample, it will be shipped to the laboratory in accordance with Department of Transportation Regulations for potentially hazardous materials.

Previous sampling of this well has shown that the NAPL collects in the well casing and the sandpack around the well casing between sampling events. If the well is purged of three well volumes of fluid prior to sampling, all of the NAPL is removed from the well casing and the sandpack, and a representative sample of the NAPL cannot be collected. Because the intent of this sampling is to analyze the NAPL, the sample will be withdrawn from the well without purging.

An insufficient quantity of the NAPL is present in monitoring well G106L to collect both an investigative and a duplicate sample from the well. Therefore, a duplicate sample will not be collected. Matrix spike and matrix spike duplicate (MS/MSD) analyses will be performed on the NAPL sample in accordance with the QAPP Addendum. Because the NAPL will be analyzed as a medium-concentration sample, collection and analysis of low-concentration trip and field blank samples would be of little value. The detection limits for medium-concentration samples are higher than the concentrations of contaminants generally detected in trip and field blank samples. Because a comparison of the low-concentration trip and field blank results to the medium-concentration NAPL results would be meaningless, no field or trip blank samples will be collected.

The NAPL investigation and MS/MSD samples will be analyzed for: (1) TCLP organics and inorganics, (2) TCL organics and TAL inorganics, (3) specific gravity, and (4) viscosity. The analysis will be performed in accordance with the methods described in the QAPP Addendum. The samples will be shipped via overnight carrier to RMAL in Arvada, Colorado. Notice will be given to the U.S. Environmental Protection Agency (USEPA) and IEPA at least 10 days prior to sampling the NAPL, and the Agencies will be permitted to split samples if a sufficient volume of NAPL is present in the well. Environmental Standards, Inc. will validate the NAPL data.

4.3 Round Two Ground Water Sampling

A second round of ground water samples will be collected from the Lenz Oil site monitoring well network (Figure 4-1). A total of 23 monitoring wells will be sampled if the existing well network is not changed; however, if MW-8S is installed and G104L and G104D are abandoned, a total of 22 monitoring wells will be sampled. The monitoring wells will be purged, and ground water samples will be collected following the same procedures specified in Section 5.2 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a). Notice will be given to the USEPA and IEPA at least 10 days prior to sampling the monitoring wells, and the Agencies will be permitted to split samples.

The samples will be analyzed for (1) TCL VOCs, SVOCs, and pesticides/PCBs; and (2) TAL dissolved and total metals and total cyanide in accordance with the CLP SOWs OLM01.0 for organics and ILM01.0 for inorganics, respectively. ARDL, Inc. of Mount Vernon, Illinois will analyze the VOC fraction, RMAL will test the SVOC and pesticide/PCB fraction, and Skinner and Sherman, located in Waltham, Massachusetts will analyze the inorganic fractions. One field blank and one duplicate sample will be obtained for every 10 or fewer investigative samples collected. These samples will be shipped to the laboratories via overnight carrier under strict chain-of-custody procedures as described in the QAPP Addendum. The Round Two monitoring well data will be validated by Environmental Standards, Inc.

4.4 Residential Well Sampling

A ground water sample will be collected from the Corwin Lenz residential well (see Figure 4-1) to verify the extent of ground water contamination northeast of the site and to evaluate the potential risk to human health caused by ground water contamination in a neighboring private

well. The well is currently in service for nonpotable water use and is equipped with a pump. A ground water sample will be collected from the well as follows:

- The diameter, static water depth, and total depth of the well will be measured to determine the volume of standing water in the well.

- The pump will be started, and water from the well will be discharged into 55-gallon drums until a minimum of three well volumes of water have been removed from the well and the temperature, pH, and specific conductivity of the purge water has stabilized. The criteria for defining stabilization of these parameters are specified in Section 5.2 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a). No more than five well volumes of water will be purged prior to collecting the ground water sample.

- Aerators, strainers, and hose attachments on the tap will be removed prior to sampling. In addition, the sample will be collected before it to passes through any residential filters, water softeners, or pressure tanks.

- A steady-flowing water stream at moderate pressure will be established, if possible, and the water will be dispensed directly into the sample containers. The sample containers will be filled in the order specified in Section 5.2 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a).

The residential well sample will be analyzed by RMAL for (1) TCL VOCs, SVOCs, and pesticide/PCBs; and (2) TAL dissolved and total metals and total cyanide. The sample will be analyzed using the special analytical method for low detection limits specified in the QAPP Addendum. Appropriate field blank, duplicate, and MS/MSD samples will be collected as described in Section 5.2 of the approved Sampling and Analysis Plan (ERM-North Central, 1990a) and analyzed using the low detection limits method specified in the QAPP Addendum (ERM-North Central, 1991c). The samples will be preserved, labeled, and shipped in accordance with the QAPP Addendum. Environmental Standards, Inc. will validate the data. The USEPA and IEPA will be notified at least two weeks prior to sampling the private well, and both Agencies will be invited to collect split samples.

4.5 Abandonment of Private Wells

To eliminate the potential for ground water contamination to migrate to deeper portions of the surficial aquifer or to be spread by using the well water for irrigation, the private well on the Williams property (see Figure 4-1) will be abandoned in accordance with the procedures specified in the Illinois Water Well Construction Code (77 Illinois Administrative Code, Part 920). If the ground water sample from the Corwin Lenz well shows significant contamination, that well will also be abandoned. The Corwin Lenz well will not be abandoned until USEPA and IEPA provide written authorization.

5.0 PHASE II REMEDIAL INVESTIGATION SCHEDULE

If all of the necessary site access agreements have been obtained, the Phase II RI activities will begin the day following final approval of the Phase II Work Plan. The schedule for completion of the Lenz Oil RI/FS, including the Phase II RI activities is presented on Table 5-1. The anticipated start and completion dates for each major project task are indicated as the number of weeks from the final approval of the Work Plan. The estimated time of completion of the RI/FS is approximately 56 weeks from the start of the Phase II activities. This schedule includes approximately 38 weeks to complete the RI and approximately 38 weeks to complete the FS, with a 20-week overlap between the approval of the final RI Report and initiation of the FS.

The anticipated dates for submittal of the draft and final deliverables, including the RI and FS Reports, are indicated on Table 5-1. All dates for submittal of deliverables from and including the Draft RI Report though the Final FS Report are contingent on the USEPA submitting a final Baseline Risk Assessment Report to the Participating Respondents by the date specified in the schedule. Any delay in the receipt of the Final Baseline Risk Assessment Report will result in comparable delays in the submittal of all subsequent deliverables. A detailed project calendar with specific deliverable dates will be prepared upon approval of the Phase II Work Plan.

REFERENCES

ERM-North Central, Inc., 1990a, Remedial Investigation/Feasibility Study Sampling and Analysis Plan, Lenz Oil Service, Inc., Lemont, Illinois, November 2, 1990.

ERM-North Central, Inc. 1990b, Remedial Investigation/Feasibility Study Quality Assurance Project Plan, Lenz Oil Service, Inc., Lemont, Illinois, December 16, 1990.

ERM-North Central, Inc. 1991a, Technical Memorandum No. 1, Description of Current Situation Report, Remedial Investigation Phase I, Task 1, Lenz Oil Service, Inc., Lemont, Illinois, May 1, 1991.

ERM-North Central, Inc. 1991b, Technical Memorandum No. 3A, Remedial Investigation Phase I, Task 1, Lenz Oil Service, Inc., Lemont, Illinois, July 2, 1991.

ERM-North Central, Inc., 1991c, Remedial Investigation/Feasibility Study Quality Assurance Project Plan Addendum, Phase II, Lenz Oil Service, Inc., Lemont, Illinois, October 7, 1991.

Table 4-1

Summary of Phase II Sampling and Analysis Program
Lenz Oil Service, Inc. RI/FS
Page 1 of 1

Sample Matrix	Field Parameters	Laboratory	Method	Laboratory Parameter	Investigative Samples			QA Samples: Duplicate			QA Samples: Field Blank			QA Samples: MS/MSD			Matrix Total
					No.	Freq.	Total	No.	Freq.	Total	No.	Freq.	Total	No.	Freq.	Total	
Ground Water	-pH, Temperature	ARDL	*see Note (1)*	TCL Volatile Organics	23	1	23	3	1	3	3	1	3	2	1	2	29
Samples From	-Specific Conductivity	RMAL	*see Note (1)*	TCL Semivolatile Organics	23	1	23	3	1	3	3	1	3	2	1	2	29
Monitoring Wells	-Water Level	RMAL	*see Note (1)*	TCL Pest/PCBs	23	1	23	3	1	3	3	1	3	2	1	2	29
	-Qualitative Description	Skinner	*see Note (2)*	TAL Dissolved Metals	23	1	23	3	1	3	3	1	3	0	0	0	29
	of Water	Skinner	*see Note (2)*	TAL Cyanide	23	1	23	3	1	3	3	1	3	0	0	0	29
	-Qualitative Organic	Skinner	*see Note (2)*	TAL Total Metals	23	1	23	3	1	3	3	1	3	0	0	0	29
	Vapor Screening with HNu																
NAPL Sample	-Qualitative Description	RMAL	*see Note (3)*	TCLP Organics & Inorganics	1	1	1	1	1	1	0	0	0	1	1	1	2
	of Oil	RMAL	*see Note (4)*	TCL Volatile Organics	1	1	1	1	1	1	0	0	0	1	1	1	2
	-Qualitative Organic	RMAL	*see Note (4)*	TCL Semivolatile Organics	1	1	1	1	1	1	0	0	0	1	1	1	2
	Vapor Screening with HNu	RMAL	*see Note (4)*	TCL Pest/PCBs	1	1	1	1	1	1	0	0	0	1	1	1	2
		RMAL	*see Note (2)*	TAL Cyanide	1	1	1	1	1	1	0	0	0	0	0	0	2
		RMAL	*see Note (2)*	TAL Total Metals	1	1	1	1	1	1	0	0	0	0	0	0	2
		RMAL	ASTM	Specific Gravity	1	1	1	0	0	0	0	0	0	0	0	0	1
		RMAL	ASTM	Viscosity	1	1	1	0	0	0	0	0	0	0	0	0	1
Residental Well	-pH, Temperature	CompuChem	*see Note (5)*	TCL Volatile Organics	1	1	1	1	1	1	1	1	1	1	1	1	3
Samples	-Specific Conductivity	CompuChem	*see Note (5)*	TCL Semivolatile Organics	1	1	1	1	1	1	1	1	1	1	1	1	3
	-Qualitative Description	CompuChem	*see Note (5)*	TCL Pest/PCBs	1	1	1	1	1	1	1	1	1	1	1	1	3
	of Water	CompuChem	*see Note (5)*	TAL Cyanide	1	1	1	1	1	1	1	1	1	0	0	0	3
	-Qualitative Organic	CompuChem	*see Note (5)*	TAL Total Metals	1	1	1	1	1	1	1	1	1	0	0	0	3
	Vapor Screening with HNu																

KEY:
CompuChem = CompuChem Laboratories, Inc.
RMAL = Rocky Mountain Analytical Laboratory
Skinner = Skinner & Sherman Laboratory, Inc.
TCL = Target Compound List
TAL = Target Analyte List
TCLP = Toxicity Characteristics Leaching Procedures
Pest/PCBs = Pesticides/PCB
ASTM = American Society for Testing and Materials
MS/MSD = Matrix Spike/Matrix Spike Duplicate
NAPL = Nonaqueous Phased Liquids

NOTES:
(1) Method CLP RAS SOW OLM01.0
(2) Method CLP RAS SOW ILM01.0
(3) SW846-1311 for sample preparation only. Analysis using method in Note (4).
(4) TCLP analysis using methods: 8240, 8270, 8080, and 8150 (RMAL SOP's in Appendix A)
(5) Low concentration samples using CompuChem SOP's

-Water samples analyzed for TAL dissolved metals will be field filtered prior to sample preservation.
-Total metals samples will not be field filtered.
-Metals samples will be preserved with HNO3; cyanide samples with NaOH; volatile organic compo
-One trip blank sample consisting of two 40-ml glass vials filled with organic-free deionized water wil each shipment of aqueous samples targeted for volatile organic analysis.
-Surface water samples will only be analyzed for the TAL metals rejected during the Phase I samplin
-MS/MSD samples are not included in the Matrix Total.

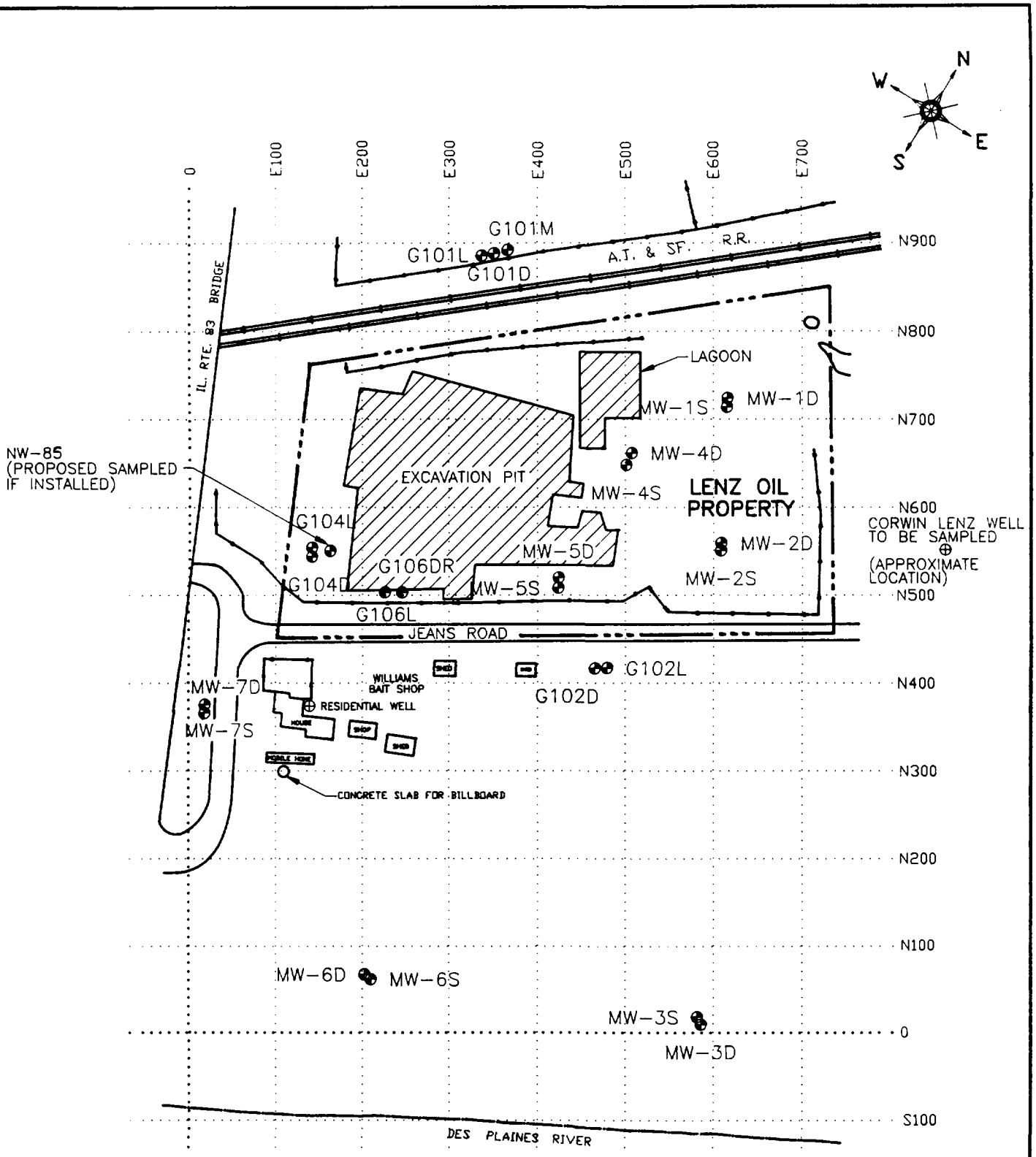
TABLE 5-1

REVISED PROJECT SCHEDULE
LENZ OIL SERVICE INC. RI/FS

Phase II, Task 1	Weeks After Phase II Work Plan Approval	
	Start	Finish
Soil Boring/Monitoring Well Installation	2	3
NAPL, Monitoring Well and Residential Well Sampling		
o Sample Collection	3	4
o Sample Analysis	4	10
o Data Validation	10	12
o Data Assessment	12	13
Private Well Abandonment	13	14
RI Phases I and II, Tasks 3 and 5		
Prepare Baseline Risk Assessment Report[1]	2	22
Prepare Draft RI Report	14	26
Agency Review of Draft RI Report	26	32
Revise Draft RI Report and Submit Final RI Report	32	36
Agency Approval of Draft Final RI Report	36	38
FS Report		
Remedial Alternatives Screening and Preparation of Alternatives Array Document	18	26
Agency Review of Alternatives Array Document	26	32
Revise Alternatives Array Document	32	36
Agency Approval of Alternatives Array Document	36	38
Remedial Alternatives Evaluation and Preparation of Draft FS Report	30	44
Agency Review of Draft FS Report	44	50
Revise Draft FS Report and Submit Draft Final FS Report	50	54
Agency Approval of Draft Final FS Report	54	56

Note:

(1) All dates for deliverables from the Draft RI Report through the Draft Final FS Report are contingent on the USEPA submitting the Baseline Risk Assessment Report to the Participating Respondents by the specfiied completion date.



PROJECT: 0252
REPORT: PHILIP
DRAWN: CMM-
CHECKED:
DATE: 10/3/91
APPROVED:
CLIENT NAME: LENZ OIL

FIGURE 4-1

ROUND TWO - GROUND WATER SAMPLING LOCATIONS
LENZ OIL, INC. SITE
LEMONT, ILLINOIS

ERM